

***Theforderma licin* McLeod and Ahmad, 2007 (Lissamphibia: Anura: Rhacophoridae), a New Frog Record for Borneo**

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Abstract A new record of the rhacophorid frog, *Theforderma licin* is reported from Gunung Serambu, in the Bau region of western Sarawak, East Malaysia, which comprises the first published record of the species from the Sundaic island of Borneo. The species was previously known from the Malay Peninsula (southern Peninsular Thailand and Peninsular Malaysia). Species of *Theforderma* are widespread in mainland and insular Southeast Asia, their arboreal habits perhaps contributing to our perception of rarity.

Keywords *Theforderma licin*, Lissamphibia, Anura, Rhacophoridae, Borneo, new record

Theforderma licin was described by McLeod and Ahmad (2007), based on specimens from southern Thailand and Peninsular Malaysia. On 13 May 2013, at 23:20 h, a subadult *T. licin* (UNIMAS 9420; Figures 1–3) was collected from the base of Gunung Serambu in the Bau region of Kuching Division, Sarawak, East Malaysia (01°25'00" N, 110°13'01" E; Timbalai 1948; Figure 4). This species was first photographed in life, euthanized, and fixed in formalin after the removal of a tissue sample for future molecular work and preserved in 70% ethanol, and accessioned with the collection of UNIMAS, Kota Samarahan, Sarawak, Malaysia.

Abbreviations and conventions include: BW = body width (width at midbody); ED = eye diameter (greatest diameter of orbit of eye); HL = head length (distance between snout-tip and angle of jaws); HW = head width (across gape); SVL = snout-vent length; TBL = tibia length; TYD = tympanum diameter (greatest diameter of tympanum); UNIMAS = Universiti Malaysia Sarawak, museum of the Institute of Biodiversity and Environmental Conservation, Kota Samarahan, Sarawak, Malaysia.

We allocated this specimen to *T. licin* following the



Figure 1 Dorsolateral view of body of *Theforderma licin* McLeod and Ahmad (UNIMAS 9420). Photo by Indraneil Das.

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Figure 2 Ventrolateral view of body of *Theloderma licin* McLeod and Ahmad (UNIMAS 9420). Photo by Indraneil Das.



Figure 3 Profile of head of *Theloderma licin* McLeod and Ahmad (UNIMAS 9420). Photo by Indraneil Das.

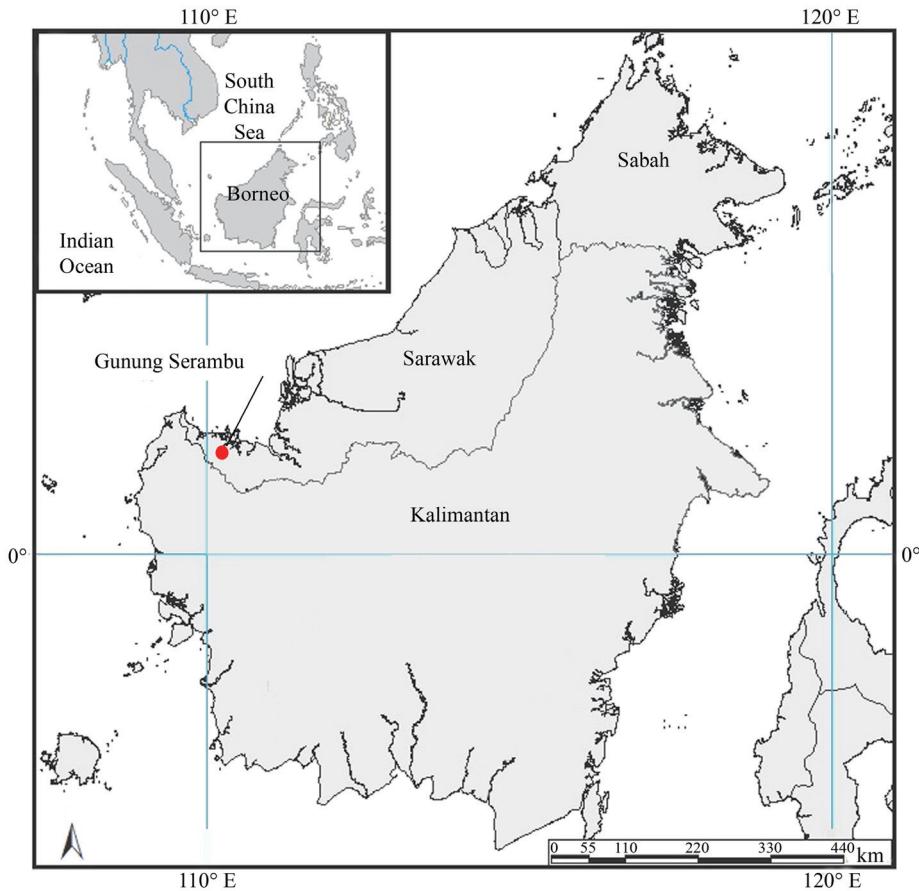


Figure 4 Map of Borneo, showing location of Gunung Serambu, in western Sarawak State, East Malaysia. Inset (top left) map of part of Southeast Asia, showing location of Borneo.

diagnosis presented in the original description of the species by McLeod and Ahmad (2007): skin of dorsum and lateral parts of body as well as fore and hind limbs with fine, pale-tipped tubercles; skin of venter weakly granular; pupil horizontally elliptical; tympanum large

(TYD = 78.38% ED) and distinct and lack tubercles; supratympanic fold reaching angle of jaws; canthus rostralis distinct; transverse sectional profile rounded; loreal region slightly concave; fingers with lateral dermal fringes and basal webbing; three oval metacarpal

tubercles; toes webbed to base of expanded tips; distinct oval inner metatarsal tubercle; outer metatarsal tubercle absent; tips of toes dilated (width of Toe III disk = 68.97% TYD); vomerine teeth absent; choanae oval; tongue acutely triangular; median lingual papillae absent; dorsum pale pinkish-cream, with dark brown inguinal and axial spots and blotches; a dark brown bar extends from snout posteriorly to supratympanic fold; venter of body and limbs with dark brown reticulations; gular region dark brown with fine, pale speckles; and iris red.

Measurements: SVL 26.7 mm; HL 9.0 mm; HW 10.5 mm; ED 3.7 mm; BW 10.01 mm; TBL 14.6 mm; TYD 2.9 mm.

Habitat: The frog was found at night on a chili plant, *Capsicum* sp. (Family: Solanaceae), ca. 1 m from substrate, at the head of a trail leading to the summit of a sandstone hill. The vegetation comprises an old secondary forest, predominated by shrubs, as well as fruit trees such as durian (*Durio* sp.), langsat (*Lansium* sp.) and mangosteen (*Garcinia* sp.). The distance from capture site to the nearest stream was ca. 300 m, and old growth trees were expected to provide appropriate breeding sites for these tree-hole breeding frogs. Gunung Serambu is located ca. 28 km away from the south of Kuching, Sarawak State's capital, and is a historically important site, in being a collection locality of Alfred Russel Wallace (1823–1913).

At least two conspecific species are known from Borneo: *T. horridum*, with records from two isolated localities in northern Borneo in Danum Valley (04°57'46" N, 117°48'09" E), Lahad Datu District, Sabah (Inger *et al.*,

1995) and Lambir Hills National Park (04°17'60" N, 113°40'01" E), Miri Division, Sarawak (Lee *et al.*, 2013) and an unnamed species from Batu Apoi (04°26'56.8" N, 115°12'16.5" E), Temburong District, Brunei Darussalam (Das, 2007). We speculate that the arboreal habits of these species, including the association with old growth forests, may have resulted in their rarity in collections, and consequently, our poor knowledge of their distribution and other aspects of field biology of frogs of the genus *Theloderma*.

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